



CSLP / CEAP

CENTRE FOR THE STUDY OF LEARNING AND PERFORMANCE
CETRE D'ÉTUDES SUR L'APPRENTISSAGE ET LA PERFORMANCE



Annual Report 2004 - 2005

2004-2005

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Annual Report

2004 -2005

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Message from the Director



Philip C. Abrami, CSLP/CEAP Director

Welcome to the 2004-2005 Annual Report of the Centre for the Study of Learning and Performance/ Centre d'études sur l'apprentissage et la performance (CSLP/CEAP). This is our second year as a provincially recognized and funded Centre of Excellence under the FQRSC Regroupements Stratégiques Programme of Infrastructure Grants.

Established in 1988, the CSLP/CEAP is a research centre consisting of 75 principal members, research collaborators and/or associates, 21 support staff, and over 180 graduate students and post doctoral fellows. Researchers are from Concordia (Education, Psychology, Applied Linguistics), McGill, Université de Montréal, UQAM, Collège Montmorency, and Vanier and Dawson Colleges. CSLP/CEAP partnerships span the Ministry of Education (Anglophone Services and the provincial QESN-RECIT), the majority of English language school boards, and some French language school boards. The CSLP/CEAP is also actively involved in several Québec-based research networks and bodies such as the Développement, intégration et évaluation des technologies de formation et d'apprentissage (DIVA group), the Centre de transfert pour la réussite éducative du Québec (CTREQ), and the New Approaches, New Solutions (NANS) project. We are involved in several pan-Canadian initiatives such as the Learning Innovations Forum (LIFIA), recently founded the Canadian Network for Knowledge Utilization (CanKnow), serve on the Steering Committee of the international Campbell Collaboration and continue our collaborative research with the Success for All Foundation (SFAF) in the United States, to name a few of our many links.

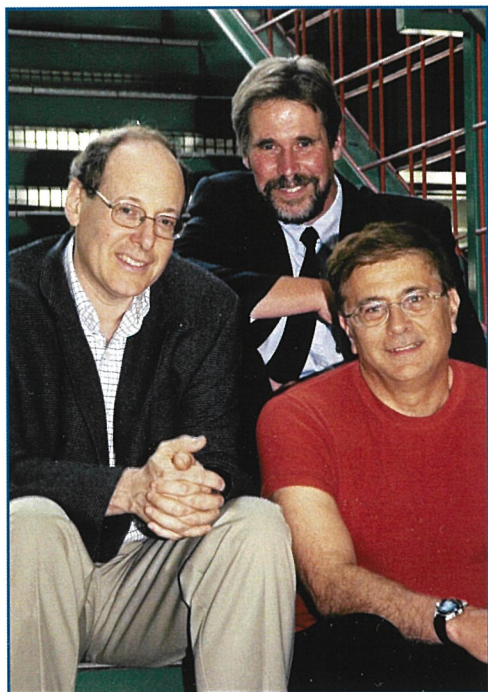
The objectives of the CSLP/CEAP are fourfold: to increase the theoretical and practical understanding of the factors that promote and hinder the learning and performance of complex skills; to provide training and support to educators and administrators; to provide the educational community with material and intellectual resources regarding new ideas in education; and to train students who have an interest in learning and performance and who are enrolled in graduate studies within the departments with which the centre and its members are affiliated.

We continue to emphasize both basic and applied research and encourage the dissemination of our findings in a variety of forms. We publish our findings in peer-reviewed journals, present at scholarly conferences, and communicate with partners via our Advisory Board, our web site and through activities such as our professional development institutes and research fairs. The CSLP/CEAP's Bi-annual Research and Technology Fair is scheduled for Thursday, November 17, 2005 at Concordia University. We hope you can attend.

It is impossible to summarize the work and accomplishments of such a diverse collection of talented individuals in just a paragraph or two. The remainder of the Annual Report highlights our accomplishments in our main themes areas. Hope you find it an enjoyable and informative read. I also encourage you to browse the CSLP/CEAP website to learn more about who we are and what we do, including a list of this year's papers, publications, and grants.

<http://doe.concordia.ca/csulp/>

But I did want to spotlight a few things I am especially proud of. First, I'm pleased to announce that two of our teams were recently funded under the FQRSC Equipe programme. Second, Dr. Lynn McAlpine was awarded the W.J. McKeachie award for research excellence in postsecondary education. Third, Bob Bernard and his team of faculty and students were awarded the 2004 Award for Research Excellence from the Canadian Association for Distance Education. Finally, Anne Wade, CSLP/CEAP Manager and Information Specialist, celebrates fifteen years as an integral part of our team. Thanks, Anne, and everyone who makes the CSLP/CEAP a true centre of excellence.



From Left to Right: Norman Segalowitz, Richard Schmid and Phil Abrami

A message from the Associate Director, Richard Schmid

The evolution of the CSLP/CEAP as an FQRSC Centre of Excellence has enabled our researchers to expand their activities in new directions. This has allowed for increased participation for students and partners. We continue to focus on our responsibility to train the next generation of Quebec and Canadian scholars and practitioners. We provide a variety of research and development opportunities in basic and applied research in a variety of fields and disciplines (e.g., educational technology, elementary, secondary and post-secondary education, psychology). For example, basic research projects include applications of cognitive process and how they impact on early literacy. At the same time, we have instructional designers and software developers working on ways to use technology to help students learn and to promote effective instruction. Our projects involve all sectors of society, including schools, industry, government and not-for-profit organizations. We place particular emphasis on mentoring students in community outreach activities that promote the transfer of knowledge into best practices.

A message from the Associate Director, Norman Segalowitz

The year 2004-2005 saw the CSLP/CEAP continue to make great strides in networking with research groups across Québec and Canada. The Centre continued to be very active within the group Développement, intégration et évaluation des technologies de formation et d'apprentissage (DIVA) (funding from Valorisation Recherche Québec: programmes structurants), and DIVA's grant was extended for another year. This group involves four large research teams working on applications of technology to education. The CSLP/CEAP is a charter member of the Centre de transfert pour la réussite éducative du Québec (CTREQ) with a permanent seat on the Board of Directors (also funded by Valorisation Recherche Québec: programmes d'envergures). CTREQ is involved in helping with the transfer of research aimed at improving school success and school retention in Québec. The CSLP/CEAP is also directly involved in the SIAA/NANS project, a province-wide multi-million dollar project, directed from the Université de Montréal, to evaluate the school reforms. The CSLP/CEAP was involved in a group that received funding from SSHRC to set up a pan-Canadian network (the Clusters program) to promote collaboration between researchers and the user community on the theme of "language performance in real time". The CSLP/CEAP is also directly involved in the International Campbell Collaboration, body that promotes and sets guidelines for the conduct of systematic reviews in education and in the establishment of CanKnow, a related network for Canada. The Centre continues to maintain links with the Canadian Language and Literacy Network (CLLRNet). Finally, the CSLP/CEAP was an active member of a working group that brought together directors and their representatives from all FQRSC funded research centres. The group's aim has been to ensure that Québec funding agencies and government ministries, as well as the general public recognize the importance of research centres in the development of international recognition for research in Québec. These external links between the CSLP/CEAP and national and regional groups, over and above its many national and international collaborative links on specific research projects, continue to make the CSLP/CEAP visible as one of the leading educational research centres in Québec and Canada.

"The year 2004-2005 saw the CSLP/CEAP continue to make great strides in networking with research groups across Québec and Canada."

Members

Full Member

Full Members are active and productive researchers who participate in a range of CSLP/CEAP activities, collaborate with other members, and help to maintain its infrastructure. Each Full Member is expected to meet all of the following criteria.

He or she:

- Fits the criteria from the appropriate Quebec granting agencies (e.g., FQRSC) for one of the following designations: "chercheur universitaire" (CHU), "nouveau chercheur" (CHUN), "chercheur retraite" (CHUT), or "chercheur de college" (CHC);
- Has expertise that appropriately complements that of the Full Member group
- Has principal responsibility for funded projects related to the CSLP's major research themes
- Has a sustained program of research reflected in publications*
- Has a sustained record of external funding for research*
- Has a record of active and productive research with at least one Full or Associate member*
- Actively supervises graduate students*
- Is actively involved in writing up grant proposals related to the CSLP's major research themes;
- Actively supports the CSLP and participates in its activities.

*In the case of new researchers (CHUN), the member must at least show potential for fulfilling the criteria stated in items 4-7.



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Deputy Provost and CIO
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Collège Montmorency

Our Productivity

Below is a summary of the grants and contracts awarded to CSLP/CEAP Faculty (Full members) and their value for the period 2004-2005. Also included is the number of publications, workshops and conferences presentations by full members, professional staff and graduate students. The number of students supervised by full members is listed last.

For an itemized list of grants, publications, presentations, training, transfer and professional activities, supervised students, fellowships and awards, please consult the document *CSLP/CEAP Annual Report 2004-2005: Productivity Section* located on our website at: <http://education.concordia.ca/cslp/CSLP-AnnualReport.php>

External Funding 2004-2005

Grants and Contracts: SSHRC (19); FQRSC (18); PAREA (4); NSERC (4); FRSQ (2); IERI (2); TESOL International Research Foundation (2); FQRNT (1); CRSNG (1); VRQ (1); NCE (1); APF (1); Inukshuk Fund (1); Norshield Development Foundation (1); ETSB (1); ASTD (1); Heritage Canada (1); MELS (1); Learning and Knowledge Group and Axcana Pharma (1); Hong Kong University Grants Council (1); Canada-Europe Community Program for Cooperation in Higher Education and Training (1).

Total number of grants and contracts is 65 with an estimated total value held in 2004-2005 (i.e., one year of multi-year grants) is \$6,933,408.

Scholarly Productivity 2004-2005

Publications

Journal articles & Manuscripts: 142
Books/Chapters/Proceedings: 52
Other: 12
Total Publications: 206

Other Dissemination Activities

Conference presentations: 133
Training and Instruction: 47
Technology-based tools and other transfer activities: 19

Training of Students

M.A. theses and internships: 72
Ph.D. dissertations: 66
Fellowships: 10

COLLABORATORS

Collaborators are researchers whose activities significantly advance the mission and out-reach of the CSLP/CEAP, through regular and sustained collaboration with at least one Full member, even though the collaborating member may not meet all of the Full member criteria. Collaborators include those located outside Quebec and Canada or who fit one of the following designations from the Quebec granting agency FQRSC: "chercheur affilié" (CHA), "chercheur gouvernemental" (CHG), "chercheur hors Quebec" (CHH), "chercheur visiteur" (VIS), "chercheur sans affiliation institutionnelle reconnue" (CHS), and "stagiaire de recherche postdoctorale" (STP).

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Workshop

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Emeritus, Education
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Success For All Foundation

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Associates are researchers working with at least one Full member and whose activity, collaboration, and/or assistance are of a more restricted nature.

A s s o c i a t e s

Post Doctoral Fellows

Post Doctoral Fellows are members who are working towards a Post Doctoral Fellowship on a research or development project related to Centre themes supervised by a Full Member.



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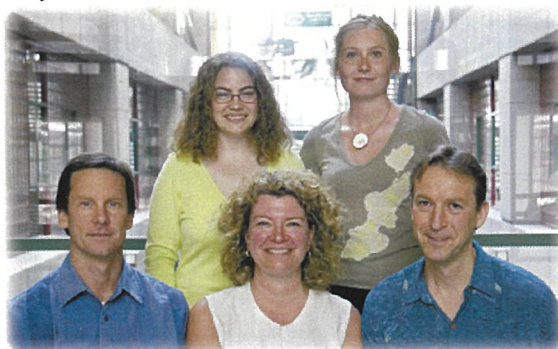
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From Left to Right: Geoff Hipps, Jen Sclater, Genevieve Légaré, Ane Jorgensen and Jeff Martin ; Missing: Brad Tucker

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Students

Student members include graduate students working toward a 2nd or 3rd cycle degree on a research or development project related to Centre themes supervised by a Full member, and undergraduate students working with a Full member on research or development projects as part of their academic program or as a research assistant.

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Benoit Danis



Roberto Muzard



Mimi Zhou



Sébastien Rainville



Vladimir Severgine

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Catherine Fichten, Theme Leader

Accessibility and Students with Disabilities

MEMBERS: *Catherine Fichten, Rhonda Amsel, Philip Abrami, and Richard Schmid*

The number of students with disabilities is increasing in most postsecondary institutions; current estimates suggest 10 -11 % of students are affected by some form of disability. Moreover, half to two-thirds of students affected by a form of disability —physical disability, learning disability, traumatic brain injury, temporary disability, etc.— remain unidentified.

The overall goal of the Accessibility and Students with Disabilities theme group is to obtain a better understanding of the conditions that affect the inclusion of individuals with various disabilities in order to ensure the accessibility of college and university education. This is done by determining best practices and raising the issue of universal instructional design as a way to prepare instructional materials for Canadian postsecondary education. A large part of this undertaking is to widely communicate the fact that people with disabilities can effectively use computers and new information technologies, and that such technologies, when appropriately designed, can begin to create more equitable learning conditions. Additionally, greater attention to universal accessibility accommodations in educational materials and practices will engender a general improvement in the quality of teaching activities, better facilitating education for all learners. In other words, this is not a restricted research focus: whatever works for students with disabilities also works for everyone else to improve the accessibility of learning practices.

Through the use of questionnaires, focus groups, and structured interviews, researchers in this theme area developing appropriate testing instruments, collect and analyze user data, and disseminate their research findings to the community of disability service providers, policy-makers, instructors, and other end-users.

Another significant aspect of this theme group's objective is to increasingly sensitize the researchers of the CSLP/CEAP to the importance of ensuring that accessibility issues are represented in their various research efforts; of the abilities of learners with disabilities, as well as the tools and accommodations that can assist them; and to highlight the importance of including participants with disabilities in their research, both as research assistants and as subjects.

The past year saw intensive research and progress on three main projects dealing with student disabilities and accessibility to postsecondary education.

The first, a recently completed PAREA-funded investigation of students with disabilities at Dawson College, considered facilitators of and obstacles to learning through the use of a questionnaire developed in variously accessible alternate formats. A significant secondary objective of this short study was to develop and test the psychometric properties of the questionnaire itself in order to assure reliability and internal consistency.

Once refined, this measurement tool was then re-applied in a second large scale study funded by the FQRSC réussite scolaire and its partners. Building on the PAREA findings, this research looked at the same variables, but applied the questionnaire across the entire CEGEP network to access a broader, bilingual sample of CEGEP students and graduates both with and without disabilities in order to ascertain the validity of the testing tool. The aim is CEGEP-wide deployment of the tool as an ongoing means to assess obstacles and facilitators, and collect crucial postsecondary educational data for dissemination to practitioners in charge of institutional evaluation, as well as to front-line disability service providers. This "knowledge mobilization" will inform policy formation, teaching practices, and the evaluation of current and future services.

Having recently completed two SSHRC research grants —one focused on adaptive and assistive technologies for postsecondary learners with disabilities, the other on policy recommendations concerning future research on people with disabilities— the third major research initiative pursued by the theme group this year focuses on issues related to the accessibility of e-learning in colleges and universities across Canada. Theme researchers, having now completed the first of three years in this SSHRC (INE) funded study have approached Key Informants (subject matter experts) in order to develop a bilingual, alternate format questionnaire that will be further developed this year. The third year of this study will see the application of this questionnaire in order to disseminate and help guide the development of best practices for five identified user groups: postsecondary students with disabilities, postsecondary disability service providers, postsecondary professors, postsecondary e-learning specialists, and educational publishers and e-vendors.

The college and university focus of this theme offers clear collaborative connections for **Catherine Fichten** and **Rhonda Amsel** to the work of the Postsecondary Education theme group. In order to better fulfill their role as sensitizers for the research efforts of the other theme groups, members of the Accessibility and Students with Disabilities theme area have also been busy participating this past year in CSLP/CEAP theme meetings and retreats, and will be presenting to the Second Language Proficiency, Critical Thinking, and Numeracy, Scientific Reasoning and Inquiry themes in the near future, with reciprocated lab visits also being planned at Dawson College. **Richard Schmid** will be exploring data on university faculty perceptions of technology and learners with disabilities in the coming year.

The coming year will see the continuation of several studies and collaborative efforts, as well as the initiation of an exciting new research collaboration with the University of Toronto CulturAll Network fund by Heritage Canada to develop hardware and software to aid in the accessible delivery of bilingual cultural content.

Basic Processes

MEMBERS: *Michael von Grünau, Philip Abrami, Phil Cohen, Denis Cousineau, Roberto de Almeida, Rick Gurnsey, Guy Lacroix, Zohra Mimouni and Norman Segalowitz*



Michael von Grünau, Theme Leader

Recently, cognitive science research has revealed a number of perceptual and cognitive factors implicated in early reading difficulties which may affect as much as 10% of the population. Cognitive science brings together research in psychology, neuroscience, linguistics, computer science and artificial intelligence to increase our understanding of such things as how language is acquired, how various types of information are processed, and how tasks are learned and performed. This research also provides a basis for developing tools and technologies that help detect and address learning problems and disorders.

The goal of the Basic Processes research theme is to better understand brain mechanisms that are thought to underlie the cognitive processing of basic visual and linguistic properties.

These mechanisms include low-level processes responsible for the recognition of attributes such as motion, texture, or syntactic parsing; attentional and automatic processes in visual and linguistic tasks like visual search, reading, or second language learning; and processes involved in the learning and performing of complex tasks such as concept formation, linguistic/visual interactions, and the achievement of superior performance.

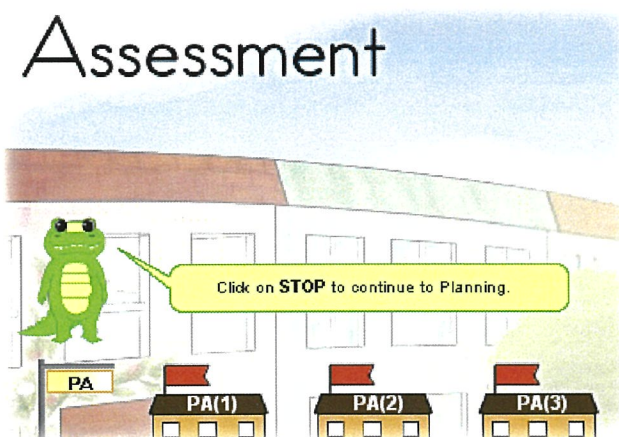
Over the past year the Basic Processes theme group has continued to play a significant role in the IERI-funded research project "Development and evaluation of a technology enhanced adaptation of the Success for All reading program." Under the leadership of post-doctoral researcher **Guy Lacroix**—emerging as an important link

between the themes—**Michael von Grünau, Roberto de Almeida, Norman Segalowitz, Denis Cousineau, and Rick Gurnsey**, and their graduate students, have investigated the diagnostic and predictive abilities of cognitive and perceptual tests, such as naming fluency, motion coherence, and the attentional blink, in relation to the ability to learn to read and to read fluently. The past year saw further field research and development of some basic tools for young participants, in the hopes of screening a large number of beginning readers as to the likelihood that they may develop reading problems later in their schooling. The results of this research have been presented at conferences and are being submitted for publication. The most promising tools are being integrated into the software tool "Alphie's Alley", a collaborative effort of several CSLP/CEAP research theme groups (see Early Literacy). A large-scale field test is underway and will be evaluated soon; should these tests prove useful, we may be able to identify children with reading difficulties years earlier than current tests allow.

In addition to this collaborative project between the three themes (Early Literacy, ICT, and Basic Processes), the Basic Processes theme also enjoys collaborative research connections with the Second Language Proficiency group, and the Numeracy, Scientific Reasoning & Inquiry group. Moreover, having researchers grouped together in the Basic Processes theme has provided greater opportunities for useful, sustained collaborations within the theme group. Specifically, ongoing collaborations exist between researchers studying the interaction of visual information and the processing of linguistic representations, connectionist models of categorization, the semantic attentional blink in bilinguals, the underlying characteristics of the RAN task, the development of language teaching skills, and a host of other topics involving psychology, education, and TESL researchers. These various collaborative efforts have resulted in the publication of numerous reports by Basic Processes theme members, as well as in participation in international and national conferences over the past year, both of which lend significant impact to the research on the scholarly and educational community.

For theme leader **Michael von Grünau**, "understanding the functioning of the brain as a perceptual and cognitive machinery that needs to operate in complex and varied environments obviously is an undertaking that involves a large number of approaches and research methodologies as well as many different theoretical directions." By engaging with and being exposed to a broad range of very different ideas through dynamic interactions with the members of the other theme areas within the CSLP/CEAP, he expects the approaches of the Basic Processes research group to become more versatile and far reaching. Having already found much common ground, they are now channeling their knowledge and ideas into tangible, solution-oriented projects.

Assessment



Critical Thinking

MEMBERS: *Bob Bernard, Phil Abrami, Mark Aulls, Richard Koestner, Lynn McAlpine, Helena Osana, Bruce Shore, Anne Wade and Cynthia Weston*



For educators, teaching learners to think critically is among the most important goals of formal schooling. This includes not only the capacity to make judgements about problems within academic subject areas, but also the ability to think systematically, objectively, and critically about the overlapping social, political, and ethical challenges of everyday life in an increasingly multi-faceted, complex world. Educators are not alone in their concern about the urgency of critical thinking skills; employers and policymakers agree that critical thinking should be considered an essential outcome of education.

Yet while there seems to be a strong desire for students to become better critical thinkers, there is evidence that this goal is not presently on the practical agenda of educators. Moreover, although there exists a vast body of research on critical thinking, there have only been limited attempts to synthesize this literature.

It is generally accepted that the periodic systematic review of large research literatures represents a means of examining broad questions, of keeping a field up-to-date with the current state of its research findings, and, crucially, of supplying evidence-based recommendations to practitioners and policy-makers. CSLP/CEAP Members active in this theme area are currently involved in the elaboration of several systematic reviews and the dissemination of relevant research findings.

In one study **Phil Abrami, Bob Bernard, Eugene Borokhovski, Mike Surkes** and **Anne Wade** of the Critical Thinking theme group have initiated a major meta-analysis to determine the effectiveness of instructional interventions in fostering and maintaining critical thinking skills and dispositions in students of all ages. As an element of a systematic review, a meta-analysis is an explicit methodology that attempts to answer broad research questions by statistically integrating smaller studies. Having considered 3500 sources, as this study advances it will attempt to answer a variety of questions respecting critical thinking in relation to educational approaches and methodologies, the measurement and improvement of skills and dispositions, contributing non-instructional factors, and various learner characteristics.

Over the past year two related collaborative efforts were undertaken in the course of this meta-analysis; one was to perform a conceptual analysis of terms that appear to overlap with critical thinking, specifically creative thinking and problem solving, and the second was an evaluation of thirteen major standardized instruments that attempt to measure critical thinking skills. One particular analysis focused on the psychometric

More on Systematic Reviews:

Believing that Canadian policy-makers, practitioners, and the general public should be better informed about the state of research evidence so that they can make informed decisions and improve practices, CSLP/CEAP researchers have come to realize that scholars must play an important role in the transfer of knowledge so that it remains meaningful to those outside of the scholarly community. Improving Canadian society means creating a better link between research and practice. Currently underway is work to establish the **Canadian Network for Knowledge Utilization (CanKnow)**, whose

Bob Bernard, Theme Leader

aim is to aid practitioners and policymakers in using the results of systematic reviews in the Canadian context for evidence-based decision-making.

In the coming year the **Critical Thinking** theme will be merged with **Numeracy, Scientific Reasoning and Inquiry** theme area, and a new theme entitled **Systematic Reviews** will be inaugurated in order to foster increasing theme overlap and collaboration.

properties of the most commonly used standardized measure of critical thinking, the Watson-Glaser Critical Thinking Appraisal. Surprisingly, this study revealed that the reliability of this test's subscales were low and highly variable, and that inter-correlations among the subscales varied widely from across studies. This indicates that the subscales might not be valid as separate measures — a problem for both researchers and practitioners. This discovery has led to further analysis to determine whether the subscales are in fact relatively independent measures, or if critical thinking is better understood as a general, organic construct. The next stage in this review will be to code selected studies for specific features (kinds of learners, subject areas, media or strategies used), and to determine what explains variability between positive and negative effects.



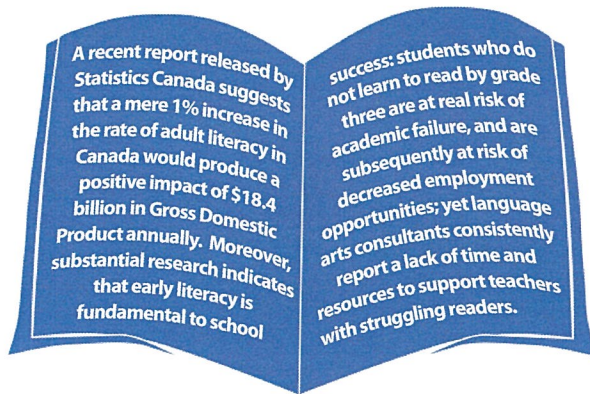
Early Literacy

MEMBERS: Philip C. Abrami, Henri Cohen, Denis Cousineau, Roberto de Almeida, Rick Gurnsey, Helena Osana, Robert Savage, Richard Schmid, Norman Segalowitz, and Michael von Grünau

COORDINATOR: Geoffrey Hipps



Philip C. Abrami, Theme Leader



The primary focus of the Early Literacy theme area is to develop software and tools that help young children learn to read and yet remain flexible enough to accommodate a wide range of instructional needs, teaching approaches, and learner characteristics.

The CSLP/CEAP's Early Literacy group uses three primary concepts to drive and regulate its research and development efforts. The first is to use the best available evidence in the design of software. To this end, projects rely heavily upon research findings and systematic reviews of educational literature to inform the development of tools that support early literacy learning. The second core concept is that the application of prototypes in the field is an essential source of feedback for the validation and refinement of tools, as well as for the methods used to evaluate them. The third key concept is that the tools deployed provide a unique platform for conducting further research on how young children learn to read, as well as for investigating instructional uses of technology and the professional development materials embedded in the tool.

The Early Literacy Theme group currently focuses on three large-scale projects that are approaching a state of maturity. The first, a highly interactive, flexible, web-based literacy resource for the elementary classroom developed under the supervision of **Geoff Hipps** and **Rob Savage**, has enjoyed funding from Industry Canada, IERI, Valorisation-Recherche Québec (VRQ), and the Chawkers foundation. Entitled ABRACADABRA, this tool offers educational activities developed in relation to narratives, focusing on three broad literacy basics (phonics, fluency, and comprehension), as well as professional development training for teachers and assessment tools. A link to our digital portfolio software will be provided in the future. In order to ensure maximal scalability and sustainability of the tool, developers have chosen to restrict size and emphasize loading speed: by focussing on the state-of-the-field rather than the state-of-the-art, ABRACADABRA has been designed for realistic use in virtually any school environment over

the web. This past year saw ABRACADABRA the focus of an ambitious formal study in two Québec school boards to determine whether the prototype affected student learning, in what specific areas of learning particular aspects of the tool worked, how, and to what extent. This process produced encouraging results, but also offered significant feedback to guide further development. This coming year will see a French-language prototype, as well as witnessing the inclusion of additional activities and further testing of the tool's effectiveness.

The second major research effort of the Early Literacy theme group, in collaboration with the Interagency Educational Research Initiative (IERI) and the Success For All Foundation, was the continuation of a five-year project (2001-2006) involving the development and evaluation of the Alphie's Alley literacy tutoring software. The past year witnessed formal experimentation with Alphie's Alley in a host of North American schools to determine its impact on the reading achievement of young children. Members were pleased to learn that high-implementation classes were approximately doubling the gains of existing Success For All programs. Findings are being used to refine the software, particularly in the area of professional development, but also have wider implications for supporting literacy educators. Results were presented at the 2004 AERA conference and a paper is forthcoming. The fifth year of this project will see general scaling up for wider deployment and study in several hundred schools.

Realizing that active collaboration at all stages is essential for drawing upon the diversity of perspectives, expertise, and skills necessary for projects of this scale and scope, this theme has pursued intense collaborations both among members and with its many partners in the field, including working with the Directors General, Directors of Pedagogical Services and the Information Technology departments, and with the ICT consultants from our partner school boards. Moreover, the various projects pursued in the Early Literacy group hold clear connections to other CSLP/CEAP themes, such as the Accessibility and Students with Disabilities, Second Language Proficiency, and Research and Development on ICT themes. A salient example is the work of **Guy Lacroix**, a post doc in the Alphie's Alley Early Literacy project, who, working with **Norman Segalowitz** and the Basic Processes team, has explored the capabilities of cognitive and perceptual tests for integration into Alphie's Alley to diagnose reading deficiencies.



Numeracy, Scientific Reasoning and Inquiry

MEMBERS: Mark Aulls, Helena Dedic, Sylvia d'Apollonia, Helena Osana, Steven Rosenfield, and Bruce Shore



Mark Aulls, Theme Leader

Overall, this research project and its set of studies, led by Steven Rosenfield and Helena Dedic, investigate how perseverance and success in college science studies is related to individual student characteristics (gender, ethnicity, self-esteem, etc.) in relation to the classroom "ecologies" created by teachers and students in science and mathematics courses.

The Numeracy, Scientific Reasoning and Inquiry theme area is composed of two complimentary lines of investigation: the study of instruction in science and mathematics at secondary and post-secondary levels of schooling, and the study of the processes and conditions associated with inquiry-oriented learning in general.

As a result of research carried out this past year, the Numeracy and Scientific Reasoning team is now entering the final year of a major set of studies making up the FQRSC, Action Concertée Grant entitled Étude des Facteurs aptes à influencer la réussite et la rétention dans les programmes de science aux cégeps anglophones.

This past year, researchers developed reliable testing methods to measure various student and teacher perceptions towards careers in sciences and mathematics/science instruction in high school and CEGEP. Overall 2476 students and 80 teachers have participated in the study, drawn from four CEGEPs in the Montreal region. The results of this study will have considerable relevance to teachers in urban settings where variance exists in the ethnic groups attending science and mathematics courses and in the equity of social and academic practices in science and math classrooms.

One study pursued this past year focuses on motivation, perceptions of classroom-ecology, and the role of cultural integration among multicultural students. Over eighteen hundred first year college students were surveyed concerning their cultural background, motivation, and perceptions of science/mathematics classroom ecology, 127 of whom felt that their heritage and host cultures were in conflict and could not be integrated within their identity. Among the culturally conflicted students there were significant negative relations between their academic motivations (which reflect parental pressure and conflict) and classroom ecology. Ongoing research will examine whether this group of conflicted, multicultural students are at particular risk for poor performance, poor coping, and early drop out from science programs.

Another study in progress examines women's perceptions of classroom ecology in science and mathematics courses. Given the fact that females are generally stronger academically relative to males at the time of their admission to CEGEP, factors other than achievement obviously influence women's decisions to pursue studies in the sciences. In this study 864 students completed questionnaires upon entering CEGEP concerning the supportiveness and effectiveness of their high school science and mathematics courses, as well as measures of attitudes toward science and mathematics, and self-efficacy beliefs.

The theme group's members hope that an examination of classroom ecology in high school and CEGEP science and mathematics classrooms, coupled with a number of social and psychological characteristics, may help us better understand the remaining barriers that exist for some women, as well as provide suggestions for interventions that can promote success and perseverance for this group of students.

In addition to the abovementioned studies, additional studies within this project looked at existing teacher practices relative to research on effective practices, and at three groups of students from a cohort of Quebec high schools students who graduated in the spring of 2003, entered CEGEP that fall, and should be entering university in the fall of 2005. These studies aim to reveal best instructional practices as well as barriers to those practices that arise in the classroom, as well as help us to better understand how to promote student attraction to, and perseverance towards, eventual careers in the sciences, engineering, or science education.

Other research conducted by group member's this past year includes Sylvia d'Apollonia's continuing collaboration in the study of biology students, which reveals that beginning biology students have considerable difficulty in constructing and manipulating verbal scientific models, tending to memorize rather than self-construct and understand such models. This research group continues to carry out technology-assisted interventions using concept mapping, on-line learning communities, and simulations. Steven Rosenfield and Helena Osana are currently involved in the evaluation of science texts, meanwhile Bruce Shore and Mark Aulls have worked towards finalizing two books on inquiry instruction that have been contracted with Lawrence Erlbaum Press. Shore, Aulls & Calvin Kalman are in the third year of their SSHRC grant "The interaction of inquiry instruction and learning". Also this year, Mark Aulls and Krista Redden presented at AERA 2005 a review of qualitative research on self-regulated learning, entitled *Qualitative approaches to the study of self regulated learning*, that will be published by Teachers College Press.

The Numeracy, Scientific Reasoning and Inquiry group looks forward to disseminating the results of their CEGEP research for use by teachers and administrators in Quebec in the near future through workshops devoted to teaching and the processes of engaging in inquiry in science, mathematics and social sciences.



Postsecondary Education

MEMBERS: *Lynn McAlpine, Philip Abrami, Cheryl Amundsen, Mark Aulls, Bob Bernard, Sylvia d'Apollonia, Helena Dedic, Steven Rosenfield, Richard Schmid, Cynthia Weston, and Laura Winer*

RESEARCH COORDINATORS: *David Syncox and Jeff Martin*



Lynn McAlpine, Theme Leader

Cheryl Amundsen, Cynthia Weston, Lynn McAlpine and **Phil Abrami** continued their study of the impact of a faculty development workshop on teacher thinking. This year, two initiatives were undertaken. One was a major literature review of the research on faculty development workshops in order to understand the assumptions about learning that underlie their designs. The second was to begin to examine the impact of post-workshop follow-up groups on professor ability to act on ideas that emerge in the workshop. **Lynn McAlpine** and **Cynthia Weston** continued their 10-year study of teacher thinking in relation to undergraduate education with this year's work directed at the link between teacher and student thinking in-class. Some particularly interesting findings

emerged about the impact of disciplinary argumentation on student meaning-making. **Bob Bernard** and **Phil Abrami** re-analyzed a subset of their distance education meta-analysis in order to report on the state of distance education research and practice in higher education. **Sylvia d'Apollonia's** study of CEGEP biology students reveals that beginning biology students have considerable difficulty in constructing and manipulating verbal scientific models, tending to memorize rather than self-construct and understand such models. Also in science education at the college level, **Helena Dedic, Steve Rosenfeld** and **Mark Aulls** are examining student persistence in science; recent results provide evidence that within their first CEGEP term a significant number of students become less interested in continuing in science.

GOAL

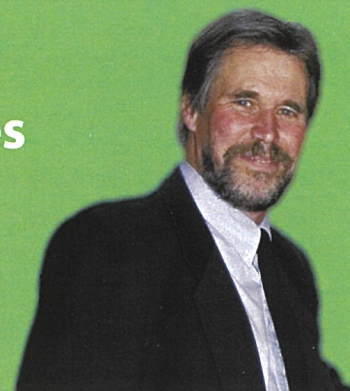
The goal of the Postsecondary Education theme area's collective research efforts is to better understand the broad range of factors involved in the creation of effective postsecondary learning environments with the capacity to foster and enhance academic successes while reducing failure. This goal requires the examination of relevant issues from a wide variety of perspectives, as well as an ongoing consideration of the many facets of learning, teaching, and the tools available to support these processes. To this end the Postsecondary Education theme group's membership reflects a multidisciplinary approach to learning and draws on the insights and expertise of researchers in psychology, mathematics, the sciences, and education.

As team leader **Lynn McAlpine** observes, true collaboration must be incremental and organic and takes time to foster; people cannot be forced to come together in their work. To this end the members of the Postsecondary Education group regularly participate in research forums in order to exchange ideas, provide feedback, and peer-edit the work of members. It has become apparent through this process that a key aspect of collaborative endeavour is development of a common language and understanding, first within theme, and then across themes. This task has been substantially advanced through the efforts of **Norman Segalowitz**, team leader of the Second Language Proficiency theme group, who has developed a common conceptual framework with the aim of establishing a common discourse and of making collaborations more natural across disciplinary and theme areas. This framework has itself led to some interesting collaborative efforts in the hopes of developing this tool further, with members of the Postsecondary Education theme participating in the planning and facilitating of a hands-on workshop this past January for the elaboration of the common conceptual framework and the establishment of a common language for researchers wishing to pursue collaboration more meaningfully. As a result of initial successes this development process continued at the CSLP/CEAP retreat in the spring.

Research and Development on Information and Communication Technologies

MEMBERS: Richard Schmid, Philip Abrami, Bob Bernard, Saul Carliner, Micha Therrien, and Anne Wade

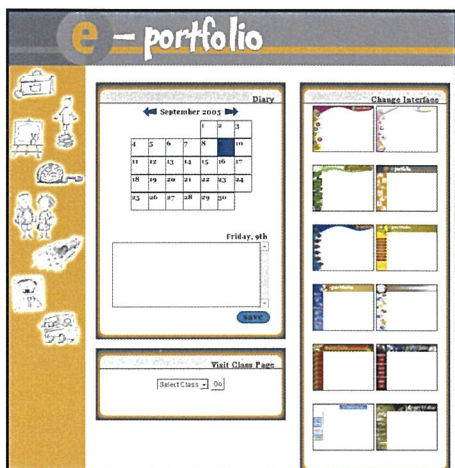
ICT CONSULTANT: Jennifer Sclater



Richard Schmid, Theme Leader

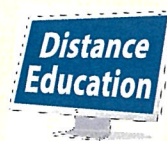
The research performed by the CSLP/CEAP is directly tied to the general societal need to improve learning skills to meet the challenges that arise in the face of rapidly changing technologies. CSLP/CEAP research aims to develop strategies and tools to facilitate students' acquisition of general competencies that foster communication, literacy, numeracy, and inquiry skills for creative use in educational and workplace settings. We are especially interested in learning how ICT can be used in this regard. Our Design and Development team, under the direction of **Micha Therrien**, works with CSLP/CEAP researchers to design innovative tools for the classroom. This past year, the team prepared a set of principles for Research; Design; Ethics and Community that are used to guide the design and development of our educational software.

Please see: <http://doe.concordia.ca/cslp/ICT-Overview.php>



HIGHLIGHTS OF SOME ICT PROJECTS

A large-scale meta-analysis focusing on the comparative literature on distance education has been conducted by **Bob Bernard, Phil Abrami, Anne Wade** and others and this resulted in an award winning publication this past November in one of the most salient educational research journals, *the Review of Educational Research*. This paper has produced several spin-off publications, with another study dealing with other aspects of distance education currently underway. In collaboration between this theme group and the Postsecondary Education theme, **Yiping Lou** has looked at the literature on distance education specifically in the context of postsecondary learners. As well, a large-scale review by **Richard Schmid, Phil Abrami, Bob Bernard, and Anne Wade** of the technology integration research literature is currently in the planning stages.



Gretchen Lowerison, Iolie, Nicolaidou, Phil Abrami and Richard Schmid continued to explore issues surrounding the techniques and resources that complement student learning preferences and the role that computer technology plays in facilitating learning. Their qualitative study examined the way in which faculty integrates technology and whether faculty differed in their beliefs about learner preferences, the use of learning resources and the advantages/disadvantages of integrating computer technology. One theme that has emerged has been how instructors view technology as learning with technology, learning from technology, and technology as a cognitive extension. Their quantitative study investigated the role that computer technology plays in transforming the learning process in higher education. Results suggest that there is a relationship between computer technology, active learning, and perceived course effectiveness where active learners gain the most benefit from computer technology use.



The CSLP/CEAP's e-portfolio software is a bilingual, process-oriented tool for use in elementary and secondary schools. Through the collaborative efforts of our portfolio team, **Beverley White** (Director, QESN-RECIT) and the provincial RECIT, our e-portfolio software was used this past year in a number of schools in an effort to increase our understanding about the design of an effective digital tool for portfolios and its impact on student learning. Designed for simplicity of use, yet able to scaffold critical, complex learning processes, e-portfolio focuses on the active construction of knowledge and self-regulation by encouraging learners to reflect, to set and refine goals, to conference with peers, teachers, and parents, and to take more responsibility and be meta-cognitively aware of their own learning. e-Portfolio provides a flexible platform that emphasizes and scaffolds, rather uniquely, process over product. The coming year will be directed toward better articulation of key processes of the portfolio process in order to encourage more active, meaningful learning rather than mere surface-processing, and the creation of professional development resources to embed in the tool, including short video vignettes, explanations, examples, and demonstrations that empower teachers to use e-portfolio. Articles on e-portfolio and its development process will appear in a special issue of the *Canadian Journal of Learning Technology*, as well as in a published collection of papers on the VRQ DIVA projects.

Second Language Proficiency

MEMBERS: *Norman Segalowitz, Walcir Cardoso, Tom Cobb, Laura Collins, Roberto de Almeida, Elizabeth Gatbonton, Marlise Horst, Joanna (London) White, Roy Lyster, Zohra Mimouni, and Pavel Trofimovich*

RESEARCH ASSOCIATE: *Randall Halter*

Second language literacy is becoming increasingly necessary as a result of rapid globalization and regional integration. The population of Québec, specifically, is touched by these developments, both at the educational and professional level, in its attempt to engage with the wider Québec community and the scientific, industrial, and commercial information of the world.



Norman Segalowitz, Theme Leader

The research of the Second Language Proficiency theme area attempts to identify best practices for promoting second language acquisition and performance. In particular, the theme group focuses on facilitating second language learning at both the micro-level of teaching and learning practices, as well as the macro-level of institutional policy related to second language instruction. Additionally, this theme area aims to develop supportive instructional materials and testing instruments for use in a variety of learning contexts.

The past year has witnessed intense, sustained collaborative research conducted on a broad range of issues related to second language proficiency, including efficiency and learning in second language classrooms, time distribution in classroom teaching of a second language, linguistic models of second language phonological development, social aspects of second language learning and fluency, on-line concordancing and instructional activities and their role in vocabulary acquisition, dual immersion programs, self-regulation in learning, the cognitive underpinnings of second language oral fluency, second language acquisition in study abroad contexts, and the impact of second language learning on first language proficiency, among others. The various research projects are funded by individual and team grants from SSHRC, NSERC, FQRSC-équipe, FQRSC nouveau chercheur, TESOL International Research Fund, internal grants, and others.

Beyond the heavy emphasis on intra-theme collaboration in the Second Language Proficiency group, the umbrella provided by the CSLP/CEAP affords the members of this group a valuable opportunity to engage with researchers from the other theme areas. Currently, collaborative activities exist between Second Language Proficiency theme group members and the Basic Processes group which investigate literacy, perceptual, and cognitive issues in first language literacy and second language acquisition, as well as with the Numeracy, Scientific Reasoning and Inquiry theme group. Moreover, to foster increased communication between the themes, **Norman Segalowitz** has been developing SAVOIR—a framework for thinking about complex learning and performance problems that gives at-a-glance prompting of the multidimensional character of human learning and performance, simultaneously providing a common language for researchers from different backgrounds to talk to each other. Such efforts at increased communication and collaboration will lead to more successful research, more successful outcomes in applications and transfer, and faster and easier sharing of expertise. Moreover, the very process of developing SAVOIR through internal consultation within the CSLP/CEAP is itself fostering communication across theme areas.

The Second Language Proficiency theme group also currently has a number of research partners at external academic institutions in western Canada, the U.S., the U.K., Spain, and Brazil, as well as at non-academic institutions. The applied linguists in the theme group, for example, work regularly with the Tyndale-St-Georges Community Centre

and SPEAQ—a professional association of ESL teachers in Québec offering workshops and teacher-friendly research seminars—to provide an important link for researchers to the community of language practitioners.

Another example of practical collaborative research is team leader **Norman Segalowitz's** participation in a pan-Canadian SSHRC Cluster group with researchers at the University of Alberta and the University of Calgary. This innovative project addresses questions regarding language performance in seven areas of Canadian life: civil society, economic development, education, health, immigration and social integration, international relations, and linguistic diversity and multiculturalism. By drawing upon the considerable existing linguistic expertise and resources available in Canada, this research initiative establishes partnerships between professionals in the target sectors and researchers with expertise in the language sciences in order to provide practical, evidence-based solutions to problems of language performance in real-time communication. Collectively, the theme group's activities contribute new knowledge to the field, make possible the transfer of knowledge, create increasing visibility for the theme's researchers, and train highly qualified personnel for second language research and instruction.

The coming year will see three primary trajectories for development of the Second Language Proficiency theme area: theme-wide team research on efficiency and L2 classroom learning, FQRSC Team Grant funded research on *perceptual and cognitive factors underlying the acquisition of reading in a first language and the acquisition of a second language*, and SSHRC funded pan-Canadian strategic research on language performance in real time, with initial emphasis from CSLP/CEAP members likely to be on the health sector and the use of a second language in aviation communication and air-traffic control.

For further information on CSLP/CEAP research and development projects please visit our website at:
<http://education.concordia.ca/cslp>

CSLP/CEAP Advisory Board:



The mandate of this board is to provide general direction on Centre projects and funding opportunities. Along with the CSLP/CEAP Executive, membership on this Board includes representatives from the Ministry of Education (Anglophone Services and the provincial QESN-RECITs); the Sir Wilfrid Laurier, English Montreal, Western Quebec, Central Quebec, Lester B. Pearson, Riverside, and New Frontiers school boards; the Learning Materials Centre; and a variety of other education organizations.

CSLP/CEAP Steering Committees:



A number of CSLP/CEAP projects, including ABRACADABRA and CanKnow, are guided by steering committees consisting of over 50 leading scholars, outstanding developers, important policy-makers, and experienced practitioners who engage in multidisciplinary and multi-sectoral research and development on major educational issues.

International Partners: Increasingly, the CSLP/CEAP is working with partners and collaborators from around the world. Some of these are listed below.

Success For All Foundation



Since 1996, the CSLP/CEAP has been working with the Success for All Foundation (SFAF) to design and provide technological supports to the highly effective Success for All Reading Roots curriculum.

Evidence Network



The Evidence Based Policy and Practice Research (UK) Network provides a starting point for accessing social science research publications relevant to policy and practice; is open to users in the research community, the voluntary sector, local and central government, public agencies and commercial organizations; provides search tools and a referral framework to enable users to pursue their enquiries; and is a forum for debate and discussion of issues and problems in relation to evidence-based policy.

Associate: Anne Wade

Learning Innovations Forum/Forum d'Innovations d'Apprentissage (LIFEA) and the European Institute for E-Learning (EIFEL)



The CSLP/CEAP collaborates with international organizations such as LIFEA and EIFEL, to encourage the use of digital portfolios in schools and the workplace. The past year, the CSLP/CEAP co-hosted, along with LIFEA and EIFEL, the first Eastern Canada Fora on E-portfolios.

Campbell Collaboration



The international Campbell Collaboration (C2) is a non-profit organization that aims to help people make well-informed decisions about the effects of interventions in the social, behavioral and educational arenas. C2's objectives are to prepare, maintain and disseminate systematic reviews of studies of interventions.

C2 Steering Group member: Philip Abrami

The CSLP/CEAP has spent over a decade working with our partners in education to ensure that the best practices, new tools, and effective techniques that we develop meet the needs of the educational community, both in Quebec and throughout Canada. We are increasingly involved in efforts to turn research evidence into practice. By uniting theory, research, and practice, we are able not only to generate new knowledge, but also to mobilize our understanding in intensive, scalable, and sustainable ways. As an extension of these efforts, this past year members of the CSLP/CEAP founded the Canadian Network for Knowledge Utilization (CanKnow), a network dedicated to collecting and disseminating evidence in the social sciences in order to inform and improve Canadian policy-making and practice. Our partners have been instrumental in providing support and guidance in this endeavour, as well as in many other successful projects.

Other Provincial and National Partners:



Adaptive Technology Resource Centre (ATRC) - UNIVERSITY OF TORONTO

To ensure that the results of our research are used, we are also involved with several Canadian- and Québec-based networks of practitioners and end users.

These include: the Adaptech

Research Network / Réseau de Recherche Adaptech, Adaptive Technology Resource Centre (ATRC) - University of Toronto, Association québécoise des étudiants ayant des incapacités au postsecondaire (AQEIPS), Association Québécoise Inter-universitaire des Conseillers aux Étudiants ayant des Besoins Spéciaux (AQICEBS), Canadian Association of Disability Service Providers in Post-Secondary Education (CADSPPE), the Learning Materials Centre, National Educational Association of Disabled Students (NEADS), the Québec English Schools Network- Réseau de personnes ressources pour le développement des Compétences des élèves par l'Intégration des Technologies (QESN-RECIT), Société pour la promotion de l'enseignement de l'anglais (langue seconde) au Québec (SPEAQ), and the Tyndale-St-Georges Community Centre.

Campbell Education Coordinating Group

The Education Coordinating Group is an international network of volunteer professionals who prepare, update and rapidly disseminate systematic reviews of high-quality educational and training interventions conducted worldwide that are aimed to improve education and learning. This past year, the Education and Information Retrieval Coordinating groups have conducted training workshops on conducting reviews and performing information retrieval, written support material for reviewers, and obtained funding for reviewers. See <http://www.caahs.colostate.edu/r-dcenter/CCECG/home.asp>

Co-Chairs: Philip Abrami, Robert Bernard, and Brian Cobb

Information Retrieval Group Liaison: Anne Wade

CSLP/CEAP

CENTRE FOR THE STUDY OF LEARNING AND PERFORMANCE
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